



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Then since the conjugate hyperbola bears the same relation to the conjugate axis that the given hyperbola does to the transverse, we may write $x''=a\tan\varphi''$, $y''=b\sec\varphi''$.

But $x''/a=y'/b$, $y''/b=x'/a$.

Hence $x''=a\tan\varphi'$, $y''=b\sec\varphi'$.

Therefore $\varphi'=\varphi'''$. But $\varphi''+\varphi'''=90^\circ$.

Then $\varphi'+\varphi''=90^\circ$.

Q. E. D.

118. Proposed by W. H. CARTER, Vice President and Professor of Mathematics, Centenary College, Jackson, La.

A picture b feet long hangs on a wall at an inclination θ to the wall, with its base a feet from the floor. How far from the wall should an admirer sit to see it to the best advantage, supposing the light to be equally distributed throughout the room.

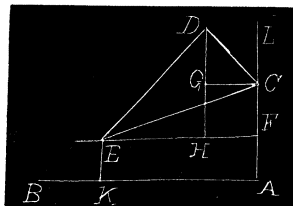
Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Mathematics and Science, Chester High School, Chester, Pa.; COOPER D. SCHMITT, A. M., Professor of Mathematics, University of Tennessee, Knoxville, Tenn.; WALTER H. DRANE, Graduate Student, Harvard University, Cambridge, Mass., and J. M. BANDY, A. M., Ph. B., Greensboro, N. C.

Let E be the position of the eye, $EK=FA=c$, $AC=a$, CD , the length of the picture $=b$, $FE=x$, $\angle LCD=\theta$, $\angle FED=\beta$, $\angle FEC=\gamma$, $\angle CED=\lambda$.

The picture is seen to the best advantage when λ is a maximum.

$$\tan\lambda = \frac{\tan\beta - \tan\gamma}{1 + \tan\beta \tan\gamma}.$$

$CG=b\sin\theta$, $DG=b\cos\theta$, $CF=a-c$, $EH=x-b\sin\theta$, $DH=a-c+b\cos\theta$.



$$\tan\beta = \frac{a-c+b\cos\theta}{x-b\sin\theta}, \quad \tan\gamma = \frac{a-c}{x}.$$

$$\therefore \tan\lambda = \frac{bx\cos\theta + b\sin\theta(a-c)}{x^2 - bx\sin\theta + (a-c)(a-c+b\cos\theta)} = \text{maximum}.$$

Differentiating and collecting terms we get,

$$x^2 + 2x(a-c)\tan\theta - (a-c)^2 - b(a-c)\sec\theta = 0.$$

$$\therefore x = \sqrt{(a-c)^2 \sec^2\theta + b(a-c)\sec\theta} - (a-c)\tan\theta.$$

If $c=0$ and $\theta=0$, $x=\sqrt{a(a+b)}$; if $c=0$ and $\theta=90^\circ$, $x=\frac{1}{2}b$; if $c=0$, $\theta=0$, and $b=\frac{5}{12}a$, $x=\frac{1}{3}a$.

Also solved, with same result, by B. F. SINE, ELMER SCHUYLER, CHARLES C. CROSS, and P. S. BERG.

Walter H. Drane should have received credit for a solution of problem 115 in the last issue.